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10/849,371

05/20/2004

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03/20/2008

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EXAMINER

SIDDIQUEE, MUHAMMAD S

ART UNIT

PAPER NUMBER

4151

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|---------------------------------------|------------------------------------|--|
| Office Action Summary | Application No. 10/849,371 | Applicant(s) MUTO ET AL. | |
| | Examiner MUHAMMAD SIDDIQUEE | Art Unit 4151 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 8-12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-12 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 May 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>8/5/2004, 5/24/2007, 7/30/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. This application contains claims directed to the following patentably distinct species:

Species 1: Figure 1

Species 2: Figure 4

Species 3: Figure 6

Species 4: Figure 7

Species 5: Figure 9

The species are independent or distinct because claims to the different species recite the mutually exclusive characteristics of such species. In addition, these species are not obvious variants of each other based on the current record.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, no claims are generic.

There is an examination and search burden for these patentably distinct species due to their mutually exclusive characteristics. The species require a different field of search (e.g., searching different classes/subclasses or electronic resources, or employing different search queries); and/or the prior art applicable to one species would not likely be applicable to another species; and/or the species are likely to raise different non-prior art issues under 35 U.S.C. 101 and/or 35 U.S.C. 112, first paragraph.

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Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species to be examined even though the requirement may be traversed (37 CFR 1.143) **and (ii) identification of the claims encompassing the elected species**, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

The election of the species may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the election of species requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected species.

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the species unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other species.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise

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require all the limitations of an allowable generic claim as provided by 37 CFR 1.141.

2. During a telephone conversation with Mr. W. Westerman, esq. on 2/28/08 a provisional election was made with traverse to prosecute the invention of Fuel cell system (Figure 1) claims 1-7. Affirmation of this election must be made by applicant in replying to this Office action. Claims 8-12 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 recites "a second passage connecting the fuel battery to exterior of the fuel battery" (line 6 of claim 1).

It appears from said recitation that applicants are adding a line from the fuel battery and connecting it back to the fuel battery, however there is no support of

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such a line found in the specification. Therefore, it is unclear that if a line is added for exhaust of the gas or recycling back to the fuel battery by the recitation of claim 1. For purposes of examinations, the examiner construes that applicants are adding a line for exhaust.

Information Disclosure Statement

6. Japanese office action dated 5/15/2007 for application number 2003-151990 is not considered due to absence of any translation.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that

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the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1, 2, 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts et al (US 2001/0055707 A1) in view of Barton et al (US 2003/0022041 A1).

Regarding claim 1 and 7, Roberts discloses a fuel cell system comprising more than one fuel cell and further comprising a conduit (269) (first passage) connecting the fuel cell stack to a purge gas (nitrogen) supply source (260); a conduit (268) (exhaust line) (second passage) connecting the fuel cell stack to exterior; a first valve (263) (first solenoid valve) installed in the first passage; a second valve (234) (second solenoid valve) installed in the second passage [Fig. 3; paragraph 0044, 0045]. Roberts does not show that the valves are solenoid valve but indicated that those can be control valves and can be controlled with a microcontroller. Roberts remain silent about current sensor. However, Barton discloses a fuel cell system comprising current sensor (S2) [paragraph 0052, 0077] producing an output indicative of current generated by the fuel cell stack, purge solenoid valve (70, CS4) [paragraph 50, 51] and a microcontroller (40) (electronic controller) [paragraph 0077, 0084, 0085]. Microcontroller (40)

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controls the purge solenoid valve (70, CS4) based on a time interval determined from the output of the current sensor (S2) [paragraph 0042, 0077]. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate solenoid valves in place of manual valves to control the valves with a controller; incorporate a current sensor and control the purge solenoid valves as taught by Barton in the fuel cell of Roberts in order to purge accumulated non-reactive components from the fuel cell stack and thereby efficient power generation.

Regarding claim 2, Barton teaches that the microcontroller (40) can be programmed to any predefined purge duration based on the input from the current sensor [paragraph 0078, 0079, 0082].

Regarding claim 4, Barton teaches a voltage sensor (S3) producing an output indicative of voltage generated by the fuel cell stack and the microcontroller (40) can purge the residue to the exterior when the voltage detected from the output of the voltage sensor falls below a threshold value [paragraph 0049, 0073, 00811].

9. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts et al (US 2001/0055707 A1) in view of Barton et al (US 2003/0022041 A1) as applied in claim 1 and in further in view of Tsutomu et al (JP 2000-243417) (JP 2000-243417 is a foreign document and a machine translation is used).

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Regarding claim 3, Roberts/Barton remain silent about a hydrogen sensor installed in the exhaust line (second passage). However, Tsutomu discloses a fuel cell system comprising a hydrogen concentration sensor (44) [paragraph 0026] installed in the exhaust line (12) to monitor hydrogen concentration for purging impurities from fuel cell [Drawing 1]. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize the concept of hydrogen measurement in the exhaust line and controlling purge as taught by Tsutomu in the system of Roberts/Barton in order to detect hydrogen concentration in the exhaust line and control purging of the fuel cell stack and thereby efficient power generation.

10. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts et al (US 2001/0055707 A1) in view of Barton et al (US 2003/0022041 A1) as applied in claim 4 and further in view of Nonobe (US 2002/0192520 A1).

Regarding claim 5, Roberts/Barton teaches to use a voltage threshold value to control purge [paragraph 0081]. However, Roberts/Barton remain silent about how to determine threshold value. Nonobe teaches that voltage threshold value is calculated from current sensor to control fuel cell system because the output current is related with the condition of the fuel cell [paragraph 0005]. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize the concept of determining voltage threshold value from current output as taught by Nonobe in the system of Roberts/Barton in order to control purge and thereby efficient power generation.

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Regarding claim 6, Barton teaches that the microcontroller (40) can be programmed to any predefined purge duration based on the input from the current sensor [paragraph 0078, 0079, 0082].

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MUHAMMAD SIDDIQUEE whose telephone number is (571)270-3719. The examiner can normally be reached on Monday-Thursday, 7:30 am to 4:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mikhail Kornnakov can be reached on 571-272-1303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free)? If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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MSS

/Michael Kornakov/

Supervisory Patent Examiner, Art Unit 4151